Challenges in Using Computer Aided Instructional Application for Teaching and Learning Pattern Drafting in Tertiary Institutions in Nasarawa State

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Abstract

The Study investigated the challenges of using computer aided Instructional Application (CAIA) for teaching and learning in Nasarawa State. 123 respondents were used as the sample, made up of 6 Lecturers and 117 students. Three objectives guided the study. The study adopted a survey research design. Data were collected using a questionnaire titled: "Computer Aided Instructional Application tool for Teaching and Learning" in Tertiary institutions in Nasarawa (CAIAQ). Data collected were analysed using mean and standard deviation. The study revealed that, there are challenges confronting the use of computer aided instructional application in teaching and learning which includes: Unavailability of computer hardware and software for teaching pattern drafting (x=3.33), lack of practical knowledge of teaching pattern drafting (3.17),high cost of relevant software and hardware(x=3.03),inadequate time for learning CAIA (x=3.67), poor learning attitude (3.50),inaccessibility to access learning resources on CAIA (X=3.24), lack of practical knowledge for learning (3.17). In conclusion, it was established that the use of computers is inevitable, and this will enhance the learning process especially in pattern drafting. Recommendation include: the role of curriculum developers, Management of institutions and the government.

Keywords: Computer Aided Application, Pattern making, learning management system, Design Innovation, Pattern Drafting.

Introduction

Pattern drafting is a successful method of obtaining patterns by the art of drawing and calculating measurement of the body figure. (Aldrich, 2006). Using the collected measurements, patterns are drawn directly onto papers. According to Porter (2010), clothing has developed to a more advanced technological involvement where manufactured materials and design innovation that has been developed and used. The use of computer by teachers and students is expected in all subject areas today more than ever before, more so that the emphasis on distance learning and online teaching is now being supported and encouraged. The extent to which computer is used as a tool for instruction to support teaching-learning experience varies between classrooms across the States and Schools (Spencer, 2012).

Burns & Bryant (2008) observed that, computers have been used in the teaching and learning process and by apparel companies since the early 2000's. Computer Aided Instructional Applications have become valuable tools for teaching and learning of pattern drafting, assisting in much of the repetitive tasks associated with pattern making. It can store an incredible amount of data that can be quickly retrieved, tweaked and re-filed. Using a mouse or stylus, patternmakers can swiftly add style details and make changes. There are many benefits to computers namely: speed, accuracy and ease of data transmission. In today's competitive environment, software

companies are zeroing in on the growing demands of the clothing manufacturer.

As countries face the era of globalization, technological innovation and emergence of new economies, a well-educated population is a requirement for the competitive world market (World Bank, 2000; UNESCO, 1998). Although extraordinary developments have taken place in various technologies, these are underutilized in the training the provide (UNESCO, 1998). The use of computer aided pattern drafting in teaching and learning is important, because it provides opportunities for teachers and students in the class to operate in an information age, however, there are challenges to the adoption, implementation and integration of computer aided pattern drafting techniques in the teaching and learning pedagogy in Nigeria.

Ejaben (2017) listed some factors adversely affecting the use of computers in schools as follows; insufficiency of computer and poor maintenance culture, desktop computer installed with archaic or obsolete software, school net (Broadband) connection often erratic, absence of database, no learning management system (LMS), no computer systems for teachers , insufficient course training, and poor handling of ICT programs by incompetent and unqualified technicians as major obstacles to the integration of computer aided pattern drafting programs and other ICT-based methodologies in classroom discourse.

Skill Fast UK (2006) cited technological drawbacks, financial problems, insufficient market information and institutional coordinating mechanisms as main impediments to the use of computers in the teaching and learning situation. Study carried out in Northern Ireland on the skill needs assessment for teaching clothing identified a gap that exists in core technical skills and knowledge amongst designers and garment technologists due to changes in technology and lack of investment in staff training, (Skill Fast UK, 2006). Developed countries like the United States and the United Kingdom are also faced with slow uptake of apparel CAD technology, citing lack of information, experts and training coupled with systems cost as the main reasons, (Skill Fast UK, 2006).

Nigeria, like other developing nations is also faced with the problem of low-level technology and training of workforce (Adejuyigbe, 2002). This is attributed to training structures that are deficient, hence unable to adequately prepare learners for a dynamic or changing labor market. Secondary and higher education in these countries demonstrate considerable insufficiency because post-secondary institutions have strong bias towards social sciences and other arts (El-Namaki, 2003). The mission of the universities is to undertake training and research activities to empower citizens with necessary skills and information for development of the society (Achola and Gray, 2006). Low funding from government funding and increased enrollment without commensurate improvement of available resources has adverse effect on Universities (UNESCO, 1998).

In the more advanced industrialized nations, there has been a staggering amount of research and publication related to the use computer for educational purposes, (Ertmer, 2016). Today, nearly everyone in the industrialized nations gained access to it and the purchase of computers for school use in such nations as the United States has been increasing in such a pace that is difficult to keep track of how many computer machines are now in American schools (Harper, 2008). Becker (2013) reported a comprehensive survey of the instructional uses of computers in United States public and non-public schools. The report suggested that over one million computers were in American elementary and secondary schools and more than fifteen million students use computers. The report also revealed that half-a-million teachers use computers during the same period. It has been almost two decades since the figures quoted above were released. Bergheim, (2017) reported that the US government made available $529 million to schools out of which 60 to70 percent was spent on computer education.

Hess & Leal, (2018) added that in Britain, the availability of computers in schools was made possible through government funding largely through the Local Education Authorities (LEA). Visscher, Wild, Smith, & Newton, (2014), reported that following Education Reform Act of 2000 in the USA, the central government made available $325 million, to promote the use of computers in schools. In Africa, concerted efforts have been made by many governments to initiate Internet connectivity and technology training programs. Such programs link schools around the world in order to improve education, enhance cultural understanding and develop skills that students need for securing jobs in the 21st century.

In Uganda, an interconnectivity program known as "Uganda School Net" is dedicated to extending educational technology throughout Uganda (Carlson and Firpo, 2017). In Senegal, teachers and students are using computers extensively as information tools. While in Nigeria, the Government is also making efforts to ensure the use of computers by teachers and students to enable them meet up with what is happening in the world. Recently the Government of Nasarawa State through the State Ministry of Education distributed computers to teachers to aid in the teaching and learning process (Nasarawa State Ministry of Education, Science and Technology, 2020).

Tertiary institutions in Nigeria are stepping up to meet with the use of computer. It is an innovation in patterns and design brought into the teaching and learning of pattern drafting. When used correctly, it increases accuracy, productivity, manage information, removes the time-consuming tasks of drawing, planning and cutting patterns by hand (Konzen and Locker, 2000). According to Bingimlas (2009), there are challenges among which is a range of students attitudes toward the use of computers, lack of sufficient fund in purchasing computer, poor administrative support, lack of computer skills, poor curriculum, scheduling difficulties, lack of training opportunities and lack of skills on how to integrate the use of computer aided instructional application in education. Anderson (2005) explains that, computer aided instructional application is a shift from the manual method of drafting to a more improved technological method of drafting garment, this is different from the traditional method of teaching which is the use of pencil and paper to communicate design (Becker, 2013). This consumes time, space and make learning some time boring.

The use of computer aided instructional application is important because of the advances in its usage. Most students have interest in the use of computers in learning, but getting a computer involves big investment. There are emphases on computer applications in almost all the courses taken in the tertiary institutions, yet most lecturers and students are not computer compliance. Technological drawbacks, insufficient market information and institutional coordinating mechanisms are the main impediments to its use in teaching and learning, however, the challenges confronting teachers and students in Nasarawa State is quite peculiar. It is, therefore, necessary to investigate the challenges in using computer aided instructional materials for teaching and learning of pattern drafting in Nasarawa state.

Objectives of the Study

The objectives of the study are as follows:

1. Examine challenges associated with the use of computers in teaching pattern drafting in some selected tertiary institutions in Nasarawa State.
2. Determine computer instruments and equipment that are available for teaching and learning pattern drafting in some selected tertiary institutions in Nasarawa State.
3. Identify Suggestions by learners and teachers on measures to adopt by Tertiary Institutions for the use of CAIA/Computers in pattern drafting.

Methodology

Research design

The research design adopted for this study is the descriptive survey research design. This involves one in which a group of people or inordinate items are studied by collecting and analyzing data from a few people or items considered to be representative of the entire population. The study was conducted in Lafia the state capital of Nasarawa State. Nasarawa state has tertiary institutions like Federal and State Polytechnics, College of Education in Akwanga, College of Agriculture, Science and Technology Lafia, Nasarawa State University in Keffi (Lafia campus) and newly established Federal University of Lafia. Two of the higher institutions' have undergraduate programs in Home Economics / Home Science and Management, Catering and hospitality.

Population

The total population for this study was 123 respondents. This comprises all the clothing lecturers and all students in 200 level to 400 level of the department of Home Science and Management in Nasarawa State University Keffi and all the students in HND I-HNDII of College of Agriculture Lafia, at the time of study.

Sample and Sampling Techniques

The sample size for the study is 123 respondents (117 students and 6 lecturers) broken down as follows: 69 students in 200 level to 400 level, 3 lecturers from the department of Home Science and Management in Nasarawa State University, Keffi; 48 students in HND I -II and 3 lecturers from the department of Home and Rural Economics, College of Agriculture Lafia. The entire population was used, since is a manageable size and the target population.

Method of Data Collection

Data was collected using a questionnaire titled: "Computer Aided Instructional Application tool for Teaching and Learning" in Tertiary institutions in Nasarawa (CAIAQ). It composed of a four (4) scale of preference with SA (4), A (3), SD (2) and D (1). This was administered to the respondents with the help of two research assistants. The respondents were given one day within which to study and respond to the questionnaire. The method was adopted to ensure a high return rate. Therefore, one hundred and twenty-three (123) questionnaires were administered to both lecturers and students were.

Data Analysis Techniques

Method of data analysis was mean and standard deviation. A criterion mean of 2.50 was established for the study such that a mean score of 2.50 and above signifies acceptance while a mean score below 2.50 signifies rejection.

Results and Discussions

Table 1 shows that out of the 13 items on the challenges associated with the use of computers in teaching pattern drafting, 7 were accepted as their mean value ranged from 2.50 to 3.33 which is above the cut off mark.

Table 1: Responses on the Challenges associated with the use of Computer in Teaching Pattern Drafting in Tertiary Institution.

S/N	Items	X	SD	Decision
1	Unavailability of computer hardware and software for teaching pattern drafting	3.33	0.52	Accepted
2	High cost of relevant computer software and hardware	3.03	0.52	Accepted
3	Lack of practical knowledge of pattern drafting using computer	3.17	0.52	Accepted
4	Poor orientation of computer usage	1.33	0.52	Rejected
5	Poor supply of electricity	2.50	0.55	Accepted
6	Lack of confidence in teaching CAIA	2.76	0.52	Accepted
7	Unavailability of training opportunity	1.33	0.52	Rejected
8	Poor learning opportunity at secondary school level	1.33	0.52	Rejected
9	Inadequate technical support for teaching CAIA	1.33	0.52	Rejected
10	Poor time planning for teaching CAIA	3.03	0.75	Accepted
11	Poor teaching attitude	1.17	0.41	Rejected
12	Lack of interest in learning pattern drafting	1.50	0.55	Rejected
13	Inaccessibility to access teaching and learning resources on CAIA	2.50	0.55	Accepted

Key: X= Mean of Lecturers, SD= Standard Deviation of Lecturers,

Responses on table 2 shows that some computer instruments and equipment are available for teaching and learning pattern drafting in tertiary institution in Nasarawa State. Ten (10) of the equipment and instruments listed were available as their mean value ranged from 2.61 to 3.80, while five (5) items were not available as their mean value ranged from 1.30 to 1.85.

Table 2: Responses on the Availability of Computer Instruments and Equipment for Teaching and Learning Pattern Drafting.

S/N	Items	X_1	SD_1	X_2	SD_2	X_G	Decision
	Instruments/Equipment						
1	Well-structured Laboratories	3.67	0.52	3.32	0.69	3.50	Available
2	Public power supply	3.67	0.52	3.54	0.53	3.61	Available
3	Stand-by generators	2.67	0.61	2.98	1.03	2.83	Available
4	Technical know-how	2.17	0.75	3.42	0.71	2.80	Available
5	Air conditions in classrooms	1.67	0.52	1.79	0.86	1.73	Not Available
6	Proper ventilation	3.83	0.41	3.75	0.52	3.80	Available
7	Computers	3.17	0.41	3.63	0.68	3.40	Available
8	Customized Printing for large size patterns	1.67	0.52	1.54	0.76	1.61	Not Available
9	Computer operators	3.00	0.00	3.60	0.64	3.30	Available
10	Projector	3.17	0.41	2.05	0.96	2.61	Available
11	Computer aided instructional applications (CAA) (software; Photo shop, Corel draw, Auto Card, illustrator).	1.33	0.52	2.03	0.89	1.68	Not Available
12	Drawing tables	3.50	0.55	3.53	0.58	3.52	Available
13	Internet connectivity	3.33	0.52	3.84	0.39	3.60	Available
14	Pattern digitizer	1.72	0.38	1.97	0.32	1.85	Not Available
15	3D Body Scanner	1.02	0.44	1.53	0.65	1.30	Not Available

Key: X_1= Mean of Lecturers, X_2= mean of students, SD_1= Standard Deviation of Lecturers, SD_2= Standard Deviation of Students, X_G= Grand Mean of the Respondents

Table 3 shows that out of the 14 items on the effort to improve the use of computer application in learning pattern drafting in tertiary institution, 10 were accepted as their mean value ranged from 2.61 to 3.67.

Table 3: Respondents' Suggestions on Measures to adopt on the Use of Computer in Learning Pattern Drafting.

S/N	Items	X	SD	Decision
1	unavailability of computers hardware and software for learning pattern drafting	3.09	1.00	Accepted
2	Provision of funds for relevant computer software and hardware	2.93	0.92	Accepted
3	Needed practical knowledge on computer in pattern drafting	3.17	1.14	Accepted
4	Needed orientation on computer usage	2.71	1.02	Accepted
5	Lack of steady supply of electricity	2.61	0.83	Accepted
6	Needed skills in learning CAIA	2.04	1.17	Rejected
7	Availability of training opportunities	2.27	0.80	Rejected
8	Learning opportunity at secondary school level	2.71	1.04	Accepted
9	Technical support for learning CAIA	1.99	0.90	Rejected
10	Adequate time for learning CAIA	3.67	0.53	Accepted
11	Poor learning attitude	3.50	0.72	Accepted
12	Lack of interest learning	2.49	1.17	Rejected
13	Congestion of laboratory during practical	2.88	0.96	Accepted
14	Inaccessibility to access and learning resources on CAIA	3.24	1.08	Accepted

Key: X= Mean of Students, SD= Standard Deviation of Students,

Discussion of Findings

The result from the findings revealed some challenges associated with the use of Computer aided Instructional Application in teaching and learning. This finding is complimented by Antiaye & Biney-Aidoo (2013) who reported that students complained of high costs in procuring a computer and found the study of CAIA interesting. Aduwa-Ogiegbean & Iyamu (2015) identified the high cost of computer hardware and software; weak infrastructure; lack of human skills and knowledge in Computer technology and lack of relevant software appropriate and culturally suitable to Nigeria as the major stumbling block for the adoption of Computer technology in Nigeria.

The result on table 2 shows that Computer Aided Instructional Application instruments and equipment that are available for teaching pattern drafting in tertiary institutions include a well-structured laboratory, light, proper ventilation, drawing tables, internet connectivity, and computer software such as photoshop, corel draw, auto cards and illustrators as well as computer operators. Air condition, printing press customized for large size patterns, body scanner and CAIA software were not available for the teaching and learning of pattern drafting in tertiary institution in Nasarawa State. This may be related to the high cost of purchasing the equipment. According to Aduwa-Ogiegbean & Iyamu (2015), tertiary institutions are not given adequate fund for high-tech equipment. Antiaye & Biney-Aidoo (2013) reported that insufficient computers is a major setback in the teaching and learning of computer aided design. Kamau (2007) showed that the adoption of apparel CAD technology at the public universities was low.

Conclusion and Recommendation

The study investigated the use of computer aided instructional application in teaching and learning of pattern drafting in tertiary institutions in Nasarawa State. The use of computers has become so relevant in the teaching and learning environment especially now that distance learning, opening universities system and the

protocols for covid19 is relevant in the country. No tool can be more appropriate than the use of computer in pattern drafting. Furthermore, the clothing and fashion industry has moved beyond free hand cutting to industrialization. Therefore, the use of computers is inevitable. Based on the findings of the study

1. School curriculum developers should implement and integrate Computer Aided pattern drafting as an instructional material for the teaching and learning of pattern drafting.
2. School administrators should provide adequate equipment and facilities needed for the use of computer aided instructional application in pattern drafting.
3. Computer aided pattern drafting instruments and equipment should be provided by the Government and management of institutions.

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